

### REMARKS/ARGUMENTS

Claims 54-86 are pending. Claim 54 has been simplified by use of the word “detecting” and now includes a specific probe beam wavelength range. Support for this wavelength range is found on page 10, line 26 of the specification. Claim 54 also explicitly indicates that the unmarked molecule has not been marked with a dye. The Applicants submit that this is implicit in the term “unmarked”, however for clarity have explicitly stated this in the claim. Support for molecules not marked with dye is found in the examples on pages 2-4 on pages 23-29 of the specification. Claims 83 and 85 have been revised as independent claims. Other consistent changes have been made to certain dependent claims. Accordingly, the Applicants do not believe that any new matter has been added. Favorable consideration and allowance of this application is respectfully requested.

The Applicants thank Examiner Kim for the courteous and helpful interview of May 18, 2005. It was suggested that the preamble of Claim 54 be revised for clarity, for example, by using a generic term such as “detecting” instead of “characterizing, quantifying, mapping or analyzing”. This change has now been made. To address the scope of enablement rejection it was suggested that the Applicants limit the pump beam wavelength to wavelengths effective for detecting nucleic acid samples, for example, as disclosed on page 10 of the specification. A wavelength range for the pump beam now appears in Claim 54. To avoid the prior art rejection, it was suggested that the claims clearly specify that the unmarked molecules do not encompass non-covalently tagged nucleic acid/dye complexes, such as those of Adelhelm and point out explicit or implicit support for such unmarked molecules. The Applicants have now so amended the claims and have pointed out support above for molecules unmarked by dye. Favorable consideration and allowance of this application is now respectfully requested.

Information Disclosure Statement

The Applicants thank Examiner Kim for detecting and correcting the citation of Adelhelm et al. The basis for this correction is evident from the authorship, title, volume number and page number of this reference.

Objection – Claim

Claim 84 was objected to as not further limiting the method of Claim 83 from which it depends. Claim 83 is directed to a method for synthesizing an oligonucleotide which includes the method steps of Claim 54 which involve analyzing the synthesized oligonucleotide. Claim 84 further requires (and thus further limits) that the analysis be conducted after each synthesis step. Since Claim 83 does not require analysis after each synthesis step it is broader than Claim 84. Accordingly, the Applicants respectfully request that this rejection be withdrawn.

Rejection—35 U.S.C. §112, second paragraph

Claims 54-86 were rejected under 35 U.S.C. 112, second paragraph, as being indefinite. As discussed with the Examiner, the Applicants have simplified the claim language to avoid this rejection. The terms “characterizing, quantifying, mapping or analyzing” are subsumed into the word “detecting” which is recited both in the preamble of the claim and in the body of the claim.

Claims 60 and 61 have been revised as suggested by the Examiner.

Claims 83 and 85 are directed to methods which incorporate the detection steps of Claim 54. For clarity, these claims have been presented as independent claims. This revision also addresses the rejections of Claims 84-86.

Rejection – 35 U.S.C. § 112, First Paragraph

Claims 54-86 were rejected under 35 U.S.C. 112, first paragraph, as not being enabled for pump beams of any wavelength. Claim 54 is now directed to pump beams having a wavelength ranging from 200-300 nm as disclosed on page 10, line 25 of the specification.

Rejection – 35 U.S.C. § 102

Claims 52-82 were rejected under 35 U.S.C. § 102(b) as being anticipated by Adelhelm et al., SPIE 2629:325-332. Adelhelm does not anticipate the present invention because it does not disclose or suggest a process for detecting a nitrogenous base, a nucleic acid or a nitrogenous base of a nucleic acid by the photothermal method (“mirage effect method”) without using any marker. The present concern is that the claim language when given its broadest interpretation might include the nucleic acids non-covalently marked with dye molecules of Adelhelm, because the noncovalent association of the nucleic acid and dye might be construed as leaving the nucleic acid unmarked (e.g., not covalently tagged).

Claim 54 has been amended to explicitly state that the nucleic acid sample is not marked with a dye. Since the nucleic acid samples of Adelhelm were marked with dyes--e.g., ethidium bromide (Fig. 5) or acridine orange (Fig. 6) --the present claims are clearly distinguishable from the Adelhelm method. Moreover, there is no disclosure of the pump beam wavelength or suggestion to select a pump beam wavelength ranging from 200-300 nm in Adelhelm as now required by Claim 54. In view of these significant differences between

the prior art process which uses a dye, and the marker-free process of the invention, the Applicants respectfully request that this rejection now be withdrawn.

Rejection – 35 U.S.C. § 102

Claims 83-86 were rejected under 35 U.S.C. § 102(b) as being anticipated by McGall, et al., U.S. Patent No. 5,843,655. This rejection is moot in view of the revision of Claim 83 which incorporates the specific steps of Claim 84. McGall does not disclose or suggest these steps.

Rejection – Double Patenting

Claims 54-86 were provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over Claims 1-26 of U.S. Patent No. 6,884,582. The claims of the prior patent require detection of “molecular recognition” between a molecule fixed on a support and a second molecule in solution, see Claim 1. In contrast, the present claims require the detection of a molecule fixed on a support. Accordingly, the Applicants respectfully submit that the present claims are patentably distinct from those of the prior patent and respectfully request that this rejection be withdrawn.

CONCLUSION

In view of the above amendments and remarks the Applicants respectfully submit that this application is now in condition for allowance. Early notification to that effect is earnestly solicited.


Respectfully submitted,

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